

CLAIMS

1. A process of producing a semiconducting layer by coating a substrate with a mixture of a semiconducting material and a substance which results in a Tg of the resulting mixture which prior to cross-linking is lower than that of the said semiconducting material, and cross-linking the said semiconducting material.
2. A process according to claim 1 in which the cross-linking is carried out at a temperature near to the resulting Tg of the mixture.
3. A process according to claim 1 or 2 in which the said substance itself contains functional groups capable of cross-linking the semiconducting material.
4. A process according to claim 1, 2 or 3 in which the semiconducting material contains functional groups capable of cross-linking the semiconducting material.
5. A process according to any one of the preceding claims in which the semiconducting material comprises a  $\pi$ -conjugated semiconducting polymer which has at least one cross-linkable group.
6. A process according to claim 5 in which the  $\pi$ -conjugated semiconducting polymer comprises poly(p-phenylene-vinylene), polyfluorene, poly-p-phenylene, polythiophene, polypyrrole and/or triarylamine units.
7. A process according to claim 6 in which the  $\pi$ -conjugated semiconducting polymer comprises at least 5% and preferably at least 40%, more preferably at least 90% of triarylamine units including their associated cross-linking groups by weight.
8. A process according to claim 7 in which the  $\pi$ -conjugated semiconducting polymer consists only of optionally substituted triarylamine units and their associated cross-linking groups.
9. A process according to claim 8 in which the  $\pi$ -conjugated semiconducting polymer comprises 2 to 400 conjugated units, more preferably 5 to 200 conjugated units and most preferably 7 to 140 conjugated units.
10. A process according to any one of claims 3 to 9 in which the functional cross-linkable groups comprise oxetane groups.

11. A process according to any one of the preceding claims in which the cross-linking is photochemically initiated.

5 12. A process according to any one of the preceding claims in which the mixture of the semiconducting material and the substance which results in a Tg of the resulting mixture which is lower than that of the said material is coated onto the substrate as a solution.

10 13. A process according to claims 3 to 12 wherein the ratio of the number of cross-linking groups in the  $\pi$ -conjugated polymer to the total number of monomer units in the  $\pi$ -conjugated polymer is 0.1 to 0.6 and more preferably 0.2 to 0.3.

15 14. A process according to any one of the preceding claims wherein the amount of said substance which reduces the Tg of the semiconducting material in the mixture is preferably 5 to 60% by weight, more preferably at least 10%, even more preferably at least 25% and still more preferably at least 40% by weight of the mixture of the said substance and the semiconducting material at the commencement of the cross-linking.

20 15. A process in which a multilayer device is produced by forming a first layer which is a cross-linked semiconducting layer on a substrate by a process according to any one of the preceding claims and forming a second layer on the first layer by solution or suspension deposition of a further layer forming material wherein the first cross-linked semiconducting layer is substantially insoluble in the solvent or suspending medium used to deposit the second layer.

25 16. A device which comprises a semiconducting layer produced by a process according to any one of the preceding claims.